



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/602,468 | 06/23/2003 | Venkat Selvamani | SPP 20.070 | 2661 |
| 34456 7590 04/15/2008 LARSON NEWMAN ABEL POLANSKY & WHITE, LLP 5914 WEST COURTYARD DRIVE SUITE 200 AUSTIN, TX 78730 | | | | |
| EXAMINER | | | | |
| AUSTIN, AARON | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1794 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 04/15/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/602,468

Applicant(s)

SELVAMANICKAM ET AL.

Examiner

AARON S. AUSTIN

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-34 and 36-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-34 and 36-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23-34 and 36-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannhart et al. (US Patent Application Publication No. 2005/0173679).

Mannhart et al. teach a superconductive article comprising a Ni-alloy substrate tape overlaid with a plurality of individually identifiable superconductive films disposed one atop another (paragraph [0041]) and in direct contact with each other free of intervening layers (Figure 5 and Example 1). A buffer, such as YSZ, is applied prior to application of the superconductive layers to the substrate (Example 1). The buffer layer may have a bi-axial texture (paragraph [0010]). The superconductive layers are a few microns in thickness (paragraph [0010]), usually about 0.5 to 1.5 microns (paragraph [0024]), and each layer may have a different thickness from the other layers (Figure 5). Thus, when multiple layers are combined, the thickness of the resulting superconductive layer falls within the ranges claimed. $\text{ReBa}_2\text{Cu}_3\text{O}_7$ is a suitable material for the superconductive layers, where Re is a rare earth or Y (paragraph [0041]). The current density exceeds 10^6 A/cm^2 ([paragraph [0011]).

Mannhart et al. do not specifically teach the claimed multiples of layers, the substrate as being stainless steel or Inconel, or the current capacity as claimed. Further, the thicknesses as claimed are not specifically taught, although they are implicitly taught as described above.

Regarding claims 1, 36 and 43, the superconductor films may be applied as multilayers free of intervening layers (paragraph [0041] and Figure 5). More particularly, multilayers of the superconductive material applied to a single substrate tape are clearly taught (paragraph [0041]). These layers may be applied by any of a number of techniques, including MOCVD as taught by Applicant, which result in atomic bonding between the layers. "Multilayers" is considered to include 3 or 4 layers as claimed. Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the number of layers for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Furthermore, two tapes may be applied to each other under pressure to result in two superconductive layers in direct contact with each other (paragraph [0042] and Figure 5). Applied pressure is expected to induce atomic bonding, at the very least van der Waals forces, between the superconductive layers. As noted above, multilayers are taught. An additional layer on either or both of the applied tapes will result in at least 3 if not 4 superconductive films in direct contact. Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the multiple layers as taught in Figure 5, since it has been held that mere duplication of

Art Unit: 1794

essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Regarding claims 24 and 25, a substrate comprising a Ni-alloy tape is taught (Example 1).

Regarding claims 26 and 27, substrates made of nickel based alloys or similar materials are taught (paragraph [0010]). Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use steel or Inconel as the substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious engineering choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 28-30, a buffer, such as YSZ, is applied prior to application of the superconductive layers to the substrate (Example 1). The buffer layer may have a bi-axial texture (paragraph [0010]).

Regarding claims 31-34, $\text{ReBa}_2\text{Cu}_3\text{O}_7$ is a suitable rare earth oxide material for the superconductive layers, where Re is a rare earth or Y (paragraph [0041]).

Regarding claims 37-40 and 43, the superconductive layers are a few microns in thickness (paragraph [0010]), usually about 0.5 to 1.5 microns (paragraph [0024]), and each layer may have a different thickness from the other layers (Figure 5). Thus, when multiple layers are combined, the thickness of the resulting superconductive layer falls within the ranges claimed. Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the thickness for the intended application, since it has been held that discovering an optimum value of a result

Art Unit: 1794

effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 41, as Mannhart et al. use like materials in a like manner as claimed, it would be expected that the superconducting article will have the same characteristics claimed, particularly the current capacity, absence a showing of unexpected results.

Regarding claim 42, the current density exceeds 10^6 A/cm² (paragraph [0011]).

Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Response to Arguments

Applicant's arguments filed 2/4/08 with respect to the Mannhart reference have been fully considered but they are not persuasive.

In particular, Applicant argues Mannhart does not teach multiple superconductive layers atomically bonded absent an intervening bonding layer.

However, the superconductor films may be applied as multilayers free of intervening layers (paragraph [0041] and Figure 5). More particularly, multilayers of the superconductive material applied to a single substrate tape are clearly taught (paragraph [0041]). These layers may be applied by any of a number of techniques, including MOCVD as taught by Applicant, which result in atomic bonding between the layers. "Multilayers" is considered to include 3 or 4 layers as claimed. Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to

Art Unit: 1794

adjust the number of layers for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Furthermore, two tapes may be applied to each other under pressure to result in two superconductive layers in direct contact with each other (paragraph [0042] and Figure 5). Applied pressure is expected to induce atomic bonding, at the very least van der Waals forces, between the superconductive layers. As noted above, multilayers are taught. An additional layer on either or both of the applied tapes will result in at least 3 if not 4 superconductive films in direct contact. Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the multiple layers as taught in Figure 5, since it has been held that mere duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Applicant argues that the multiple layers of Mannhart are limited to embodiments wherein intermediate layers are present as set forth in Examples 2 and 3. However, Mannhart is not limited to Examples 2 and 3. More particularly, paragraph [0041] specifically provides for alternative embodiments wherein the superconductive layers are formed of multilayer films on a substrate tape. There is no requirement for intermediate layers as suggested. One of ordinary skill in the art at the time of the claimed invention would recognize that paragraph [0041] provides for application of multiple films in direct contact using methods that result in atomic bonding as set forth above. While the number of layers that may be applied as the taught "multilayers" is not

Art Unit: 1794

specifically identified, it is within the skill of one of ordinary skill in the art to determine the number of layers that may be applied. That is to say, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the number of layers for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Daimatsu et al. and Mokura et al. (JP2003-323822 and JP2007-220467) teach multiple RE123 superconductive layers.

Honjo et al. (JP2003-34527) teach a RE-base oxide superconductor formed from several precursor layers.

Kono et al. (JP64-063216 and JP1100820) teach an oxide superconductor composed of three layers formed using different methods.

Rohr et al. (EP0323582) teach a superconductor having two or three layers.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1794

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON S. AUSTIN whose telephone number is (571)272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1794

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John J. Zimmerman/
Primary Examiner, Art Unit 1794

/Aaron Austin/